

PIVERS ISLAND AND LABORATORY.



BEAUFORT LABORATORY—EXTERIOR VIEW.

R E P O R T  
OF THE  
UNITED STATES COMMISSIONER OF FISH AND FISHERIES  
FOR THE  
FISCAL YEAR ENDING JUNE 30, 1902.

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I have the honor to submit a report covering the fish-cultural work and scientific and statistical investigations of the United States Commission of Fish and Fisheries for the fiscal year ending June 30, 1902, together with the detailed reports of the assistants in charge of its different divisions.

**PROPAGATION OF FOOD-FISHES.**

Natural conditions governing the collection of eggs were generally very favorable at all points where operations were carried on, and increased appropriations made it possible to take advantage of these conditions. The Commission was therefore enabled to keep up its record and show an increased output of nearly all of the species handled, and in the aggregate there were distributed over 1,495,500,000 fish and eggs, or 321,700,000 more than last year. Of these, 99 per cent were in the interests of the commercial fisheries and 1 per cent, or 14,900,000, were game fishes. Popular interest in the Commission and wider knowledge of its functions are shown by the increasing number of applications for fish to stock interior waters, 3,814 having been received, or 25 per cent more than the previous year.

The propagation of quinnat salmon was carried on in California, Oregon, and Washington, at 12 stations, including several collecting camps, and the season's work was considered very satisfactory. The runs of fish in the various streams were in most cases good, and over 56,000,000 eggs were collected. 29,300,000 fry and fingerlings were hatched and planted and 17,480,000 eggs were transferred to the California State Commission. As far as possible fry were held and fed during the winter and planted when about  $2\frac{1}{2}$  inches long, but lack of room and other facilities prevented pursuing this policy to its full extent. A few silver-salmon eggs were taken on a tributary of Rogue River, Oregon, and steelhead-trout eggs were obtained at the same

point and at the Baker Lake Station in Washington. The collection of steelhead eggs was hampered by unfavorable weather and scarcity of fish. At Baker Lake 3,694,000 blueback-salmon eggs were taken and hatched with a small percentage of loss, and the fry were planted in the lake.

Over 41,000,000 lake-trout eggs were obtained from commercial fishermen in Lake Superior and Lake Michigan; of these, 5,000,000 were assigned to various State commissions and other applicants, and the remainder hatched by the Commission, the fry—except some 700,000—being planted in the Great Lakes.

In Lake Erie the number of white-fish eggs secured from fishermen exceeded any previous record, the hatchery at Put-in Bay at one time being so crowded that they were retained in temporary devices. The facilities for holding the white-fish in pens were increased, but, owing to unpropitious weather, not many eggs were obtained from fish thus held at Lake Erie points, though at the collecting stations on the Detroit River the results were very successful. The total take of white-fish eggs amounted to 701,900,000, of which 111,000,000 were assigned to State commissions and others and the balance hatched at different stations of the Commission, whence the fry were planted in the lakes. The quality of the fry was unusually good.

Although April was cold and unfavorable, 437,000,000 pike-perch eggs were taken in Lake Erie, but the weather conditions were such that the percentage of fry was comparatively small. At Swanton, Vt., 113,000,000 eggs of this species were also obtained. No lake herring were taken, as the work was interrupted by ice before any spawning fish were found.

On the New England coast 338,120,000 cod eggs were collected and hatched at Woods Hole and Gloucester, Mass. Those from the brood fish taken off Nantucket Shoals and held at Woods Hole were of exceptionally good quality. Cod were scarce on the Maine coast, and the number of eggs from this source was not large. From Plymouth fishermen, however, the supply was good.

The flat-fish work was more successful than in the preceding year, both in the collection of eggs, which amounted to 194,000,000, and in the hatching of fry.

The collection of lobster eggs was also more satisfactory, though some of the territory in Massachusetts formerly depended on was abandoned. In Maine, however, egg-bearing lobsters were abundant. Eggs from all sources numbered 103,898,000, which, except for 5,000,000 devoted to experiments in hatching and rearing, were hatched at the New England stations and yielded 81,000,000 fry.

The runs of shad in the rivers where the Commission operates were small, owing to the late spring, and consequently the take of eggs shows a falling off, the station on the Potomac being the only one

where there was an increase, while on the Delaware, where the collections have usually been large, there was a great decrease. 141,239,000 eggs were secured from all points and 107,000,000 fry were hatched and planted. Considerable consignments were sent to rivers north and south, where the shad runs have been diminishing in recent years.

The propagation of the trouts, basses, and other fish appropriate for interior waters has been satisfactorily continued, and these species supplied to applicants in all parts of the country. The collections of wild fishes from overflowed lands along the Mississippi River continued throughout the summer, and large numbers of bass and other native fishes were saved and distributed. On the Illinois River this work was curtailed by the excessive heat, which caused the death of many fishes in the shallow ponds.

In continuation of the policy of acclimatizing certain species in sections of the country to which they are not indigenous, steelhead and grayling eggs were brought from the West to be hatched at eastern stations, and white-fish, lake-trout, and brook-trout eggs were sent to the Pacific coast, where they were hatched and planted. Landlocked salmon eggs from Maine were sent to various places as far west as Utah.

Twenty-nine species of fish and one crustacean have been handled during the fiscal year, and in the following tables and in the reports of station superintendents are shown the results attained in hatching the eggs and the disposition of the product.

*Distribution and assignments of fish and eggs among the States and Territories.*

| State or Territory. | Species.            | Eggs.           | Fry and fingerlings. | Adults and yearlings. |  |
|---------------------|---------------------|-----------------|----------------------|-----------------------|--|
| Alabama             | Shad                |                 | 450,000              |                       |  |
|                     | Rainbow trout       |                 |                      | 3,400                 |  |
|                     | Brook trout         |                 |                      | 200                   |  |
|                     | Cat-fish            |                 |                      | 1,300                 |  |
|                     | Black bass          |                 |                      | 9,000                 |  |
|                     | Crappie             |                 |                      | 500                   |  |
|                     | Rock bass           |                 |                      | 300                   |  |
| Arizona             | Bream               |                 |                      | 7,000                 |  |
|                     | Rainbow trout       |                 |                      | 1,400                 |  |
|                     | Black bass          |                 |                      | 550                   |  |
|                     | Strawberry bass     |                 |                      | 400                   |  |
| Arkansas            | Sun-fish            |                 |                      | 500                   |  |
|                     | Rainbow trout       |                 |                      | 2,700                 |  |
|                     | Black bass          |                 |                      | 2,225                 |  |
|                     | Crappie             |                 |                      | 200                   |  |
|                     | Rock bass           |                 |                      | 100                   |  |
| California          | Sun-fish            |                 |                      | 500                   |  |
|                     | Quinnat salmon      | 17,480,410      | 2,115,550            |                       |  |
| Colorado            | Landlocked salmon   | 5,000           |                      |                       |  |
|                     | Steelhead trout     | 10,000          |                      |                       |  |
|                     | Lock Leven trout    |                 | 3,000                |                       |  |
|                     | Rainbow trout       |                 | 160,000              | 5,200                 |  |
|                     | Black-spotted trout | 20,000          |                      | 765,000               |  |
|                     | Brook trout         |                 | 745,000              | 85,500                |  |
|                     | Grayling            |                 | 100,000              |                       |  |
|                     | Black bass          |                 |                      | 75                    |  |
|                     | Connecticut         | Shad            |                      | 6,000,000             |  |
|                     |                     | Atlantic salmon | 200,000              |                       |  |
| Landlocked salmon   |                     | 25,000          |                      |                       |  |
| Rainbow trout       |                     |                 | 2,000                | 3,200                 |  |
| Brook trout         |                     |                 | 55,000               | 4,000                 |  |
| Lake trout          |                     | 250,000         | 20,000               |                       |  |
| Black bass          |                     |                 |                      | 150                   |  |
| Crappie             |                     |                 |                      | 100                   |  |
| Rock bass           |                     |                 |                      | 200                   |  |
| Delaware            |                     | Lobster         |                      | 1,151,000             |  |
|                     | Shad                |                 | 7,092,000            |                       |  |
|                     | Rainbow trout       |                 |                      | 1,800                 |  |

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*Distribution and assignments of fish and eggs among the States and Territories—Cont'd.*

| State or Territory.  | Species.            | Eggs.   | Fry and fingerlings. | Adults and yearlings. |
|----------------------|---------------------|---------|----------------------|-----------------------|
| District of Columbia | Shad                |         | 800,000              | 2,000,000             |
|                      | Cat-fish            |         |                      | 30,000                |
| Florida              | Black bass          |         | 6,010,000            | 100                   |
|                      | Shad                |         |                      | 300                   |
|                      | Cat-fish            |         |                      | 1,650                 |
| Georgia              | Black bass          |         |                      | 310                   |
|                      | Bream               |         | 2,550,000            |                       |
|                      | Shad                |         |                      | 16,700                |
|                      | Rainbow trout       |         |                      | 4,250                 |
|                      | Cat-fish            |         |                      | 8,684                 |
| Idaho                | Black bass          |         |                      | 700                   |
|                      | Rock bass           |         |                      | 6,059                 |
|                      | Bream               |         |                      | 38,000                |
|                      | Black-spotted trout | 75,000  | 100,000              | 11,500                |
|                      | Brook trout         |         |                      | 500                   |
| Illinois             | Rainbow trout       |         |                      | 6,700                 |
|                      | Black bass          |         |                      | 1,990                 |
|                      | Crappie             |         |                      | 400                   |
|                      | Rock bass           |         |                      | 100                   |
|                      | Warmouth bass       |         |                      | 300                   |
|                      | Sun-fish            |         |                      |                       |
| Indiana              | Rainbow trout       |         | 4,500                |                       |
|                      | Brook trout         |         | 45,000               |                       |
|                      | Pike perch          |         | 16,000,000           |                       |
|                      | Black bass          |         |                      | 18,600                |
|                      | Crappie             |         |                      | 945                   |
| Indian Territory     | Rock bass           |         |                      | 900                   |
|                      | Rainbow trout       |         |                      | 1,000                 |
|                      | Black bass          |         |                      | 1,675                 |
|                      | Crappie             |         |                      | 600                   |
|                      | Rock bass           |         |                      | 200                   |
| Iowa                 | Strawberry bass     |         |                      | 350                   |
|                      | Quinnat salmon      |         | 4,000                |                       |
|                      | Rainbow trout       |         | 215,000              | 54,475                |
|                      | Brook trout         |         | 10,000               | 4,500                 |
|                      | Lake trout          |         | 30,000               |                       |
|                      | Grayling            |         | 50,000               |                       |
|                      | Cat-fish            |         |                      | 58,120                |
|                      | Pike perch          |         |                      | 600                   |
|                      | Pickereel           |         |                      | 805                   |
|                      | Yellow perch        |         |                      | 1,100                 |
|                      | Buffalo-fish        |         |                      | 200,000               |
|                      | Black bass          |         |                      | 19,630                |
|                      | Crappie             |         |                      | 702,620               |
|                      | Rock bass           |         |                      | 200                   |
|                      | Sun-fish            |         |                      | 603,890               |
| Kansas               | Black bass          |         |                      | 12,675                |
|                      | Crappie             |         |                      | 2,960                 |
|                      | Rock bass           |         |                      | 1,530                 |
| Kentucky             | Black bass          |         |                      | 13,885                |
|                      | Crappie             |         |                      | 1,395                 |
| Louisiana            | Rock bass           |         |                      | 700                   |
|                      | Black bass          |         |                      | 2,275                 |
|                      | Crappie             |         |                      | 1,425                 |
| Maine                | Strawberry bass     |         |                      | 600                   |
|                      | Atlantic salmon     |         | 48,715               | 282,000               |
|                      | Landlocked salmon   | 20,000  | 619,785              | 74,582                |
|                      | Steelhead trout     |         | 12,046               | 84                    |
|                      | Rainbow trout       |         |                      | 1,406                 |
|                      | Brook trout         | 370,000 | 1,080,863            | 643                   |
|                      | Scotch sea trout    |         | 7,694                | 6,837                 |
|                      | Grayling            |         | 36,333               |                       |
|                      | Lobster             |         | 37,100,000           |                       |
|                      | Shad                |         | 21,897,000           |                       |
| Maryland             | Rainbow trout       | 50,000  |                      | 15,650                |
|                      | Brook trout         |         |                      | 8,350                 |
|                      | Pike perch          |         | 1,800,000            |                       |
|                      | Black bass          |         |                      | 250                   |
|                      | Shad                |         | 6,400,000            |                       |
| Massachusetts        | Landlocked salmon   | 40,000  |                      | 500                   |
|                      | Rainbow trout       | 50,000  |                      | 2,000                 |
|                      | Brook trout         | 50,000  | 75,000               | 14,600                |
|                      | Lake trout          |         | 20,000               |                       |
|                      | Scotch sea trout    | 10,000  |                      |                       |
|                      | Black bass          |         |                      | 675                   |
|                      | Rock bass           |         |                      | 600                   |
|                      | Cod                 |         | 212,001,000          |                       |
| Michigan             | Flat-fish           |         | 168,133,000          |                       |
|                      | Lobster             |         | 38,107,000           |                       |
|                      | Steelhead trout     |         | 160,000              |                       |
|                      | Loch Leven trout    |         | 75,000               |                       |
|                      | Rainbow trout       |         | 68,500               |                       |

*Distribution and assignments of fish and eggs among the States and Territories—Cont'd.*

| State or Territory. | Species.                 | Eggs.      | Fry and fingerlings. | Adults and yearlings. |
|---------------------|--------------------------|------------|----------------------|-----------------------|
| Michigan.....       | Brook trout.....         | 25,000     | 911,000              | .....                 |
|                     | Lake trout.....          | 1,000,000  | 15,295,000           | .....                 |
|                     | Grayling.....            | 100,000    | 200,000              | .....                 |
|                     | White-fish.....          | .....      | 245,300,000          | .....                 |
|                     | Pike perch.....          | 50,000,000 | 1,500,000            | .....                 |
| Minnesota.....      | Black bass.....          | .....      | .....                | 8,850                 |
|                     | Steelhead trout.....     | .....      | 66,900               | 25,000                |
|                     | Rainbow trout.....       | .....      | 32,000               | .....                 |
|                     | Brook trout.....         | .....      | 107,230              | 1,900                 |
|                     | Lake trout.....          | .....      | 1,964,000            | .....                 |
|                     | Grayling.....            | 10,000     | 124,000              | .....                 |
|                     | Black bass.....          | .....      | .....                | 3,500                 |
| Mississippi.....    | Crappie.....             | .....      | .....                | 500                   |
|                     | Rainbow trout.....       | .....      | .....                | 500                   |
|                     | Black bass.....          | .....      | .....                | 16,125                |
|                     | Crappie.....             | .....      | .....                | 4,650                 |
| Missouri.....       | Rock bass.....           | .....      | .....                | 6,890                 |
|                     | Bream.....               | .....      | .....                | 500                   |
|                     | Rainbow trout.....       | 21,090     | 24,275               | 30,678                |
|                     | Brook trout.....         | 20,000     | .....                | .....                 |
|                     | Grayling.....            | 50,000     | .....                | .....                 |
|                     | Pike perch.....          | 10,000,000 | .....                | .....                 |
|                     | Black bass.....          | .....      | .....                | 2,189                 |
| Montana.....        | Crappie.....             | .....      | .....                | 2,250                 |
|                     | Rock bass.....           | .....      | .....                | 351                   |
|                     | Strawberry bass.....     | .....      | .....                | 10,000                |
|                     | Steelhead trout.....     | .....      | .....                | 258,500               |
|                     | Black-spotted trout..... | .....      | .....                | 15,000                |
|                     | Brook trout.....         | .....      | .....                | 9,925                 |
|                     | Grayling.....            | .....      | 525,000              | 1,800                 |
| Nebraska.....       | Black bass.....          | .....      | .....                | .....                 |
|                     | Rainbow trout.....       | 50,000     | .....                | .....                 |
|                     | Brook trout.....         | 50,000     | .....                | .....                 |
|                     | Black bass.....          | .....      | .....                | 1,240                 |
|                     | Rock bass.....           | .....      | .....                | 1,000                 |
| Nevada.....         | Crappie.....             | .....      | .....                | 300                   |
|                     | Brook trout.....         | 5,000      | .....                | .....                 |
|                     | Atlantic salmon.....     | 100,000    | .....                | .....                 |
|                     | Landlocked salmon.....   | .....      | .....                | 8,759                 |
| New Hampshire.....  | Rainbow trout.....       | .....      | .....                | 900                   |
|                     | Brook trout.....         | 25,000     | 7,000                | 31,241                |
|                     | Lake trout.....          | .....      | 330,000              | .....                 |
|                     | Golden trout.....        | 500,000    | 120,000              | .....                 |
|                     | Pike perch.....          | .....      | 69,950               | .....                 |
|                     | Black bass.....          | .....      | 3,000,000            | .....                 |
|                     | Lobster.....             | .....      | 2,200,000            | .....                 |
|                     | Shad.....                | .....      | 7,597,000            | .....                 |
|                     | Landlocked salmon.....   | 10,000     | .....                | .....                 |
|                     | Rainbow trout.....       | .....      | .....                | 1,450                 |
| New Jersey.....     | Brook trout.....         | 20,000     | .....                | .....                 |
|                     | Crappie.....             | .....      | .....                | 400                   |
|                     | Rainbow trout.....       | .....      | .....                | 6,600                 |
|                     | Black-spotted trout..... | .....      | .....                | 10,000                |
|                     | Black bass.....          | .....      | .....                | 1,700                 |
|                     | Rock bass.....           | .....      | .....                | 1,200                 |
|                     | Strawberry bass.....     | .....      | .....                | 200                   |
| New Mexico.....     | Sun-fish.....            | .....      | .....                | 600                   |
|                     | Shad.....                | .....      | 2,123,000            | .....                 |
|                     | Atlantic salmon.....     | .....      | 4,050                | .....                 |
|                     | Landlocked salmon.....   | 45,000     | 3,870                | .....                 |
|                     | Steelhead trout.....     | .....      | .....                | 1,319                 |
|                     | Rainbow trout.....       | .....      | 38,360               | 1,000                 |
|                     | Brook trout.....         | .....      | 744,350              | 3,500                 |
|                     | Lake trout.....          | 2,710,000  | 3,188,630            | .....                 |
|                     | Grayling.....            | 70,000     | .....                | .....                 |
|                     | White-fish.....          | 8,100,000  | 34,900,000           | .....                 |
| New York.....       | Pike perch.....          | .....      | 8,200,000            | .....                 |
|                     | Black bass.....          | .....      | .....                | 200                   |
|                     | Rock bass.....           | .....      | .....                | 200                   |
|                     | Shad.....                | .....      | 22,909,500           | .....                 |
|                     | Rainbow trout.....       | 25,000     | .....                | 23,875                |
|                     | Brook trout.....         | .....      | .....                | 500                   |
|                     | Black bass.....          | .....      | .....                | 300                   |
| North Carolina..... | Crappie.....             | .....      | .....                | 100                   |
|                     | Rock bass.....           | .....      | .....                | 1,700                 |
|                     | Rainbow trout.....       | .....      | .....                | 3,000                 |
|                     | Brook trout.....         | .....      | .....                | 1,000                 |
|                     | Cat-fish.....            | .....      | .....                | 2,000                 |
|                     | Pike perch.....          | .....      | .....                | 75                    |
|                     | Yellow perch.....        | .....      | .....                | 600                   |
|                     | Black bass.....          | .....      | .....                | 8,681                 |
|                     | Crappie.....             | .....      | .....                | 300                   |
|                     | Rock bass.....           | .....      | .....                | 200                   |
| North Dakota.....   | Sun-fish.....            | .....      | .....                | 250                   |

*Distribution and assignments of fish and eggs among the States and Territories—Cont'd.*

| State or Territory. | Species.                 | Eggs.      | Fry and fingerlings. | Adults and yearlings. |
|---------------------|--------------------------|------------|----------------------|-----------------------|
| Ohio.....           | Rainbow trout.....       |            | 13,000               |                       |
|                     | Brook trout.....         |            | 85,000               |                       |
|                     | Lake trout.....          |            | 3,500                |                       |
|                     | White-fish.....          |            | 200,500,000          |                       |
|                     | Pike perch.....          |            | 125,500,000          |                       |
|                     | Black bass.....          |            |                      | 5,080                 |
| Oklahoma.....       | Crappie.....             |            |                      | 330                   |
|                     | Rock bass.....           |            |                      | 700                   |
|                     | Rainbow trout.....       |            |                      | 3,000                 |
|                     | Black bass.....          |            |                      | 5,600                 |
|                     | Rock bass.....           |            |                      | 1,100                 |
|                     | Strawberry bass.....     |            |                      | 1,450                 |
| Oregon.....         | Quinnat salmon.....      | 1,866,000  | 14,401,619           |                       |
|                     | Silver salmon.....       |            | 424,530              |                       |
|                     | Steelhead trout.....     |            | 20,250               |                       |
|                     | Rainbow trout.....       |            |                      | 18,745                |
|                     | Black-spotted trout..... |            |                      | 15,000                |
|                     | Brook trout.....         |            | 138,979              | 74,876                |
| Pennsylvania.....   | Lake trout.....          |            | 45,498               |                       |
|                     | Shad.....                |            | 598,000              |                       |
|                     | Rainbow trout.....       |            |                      | 61,000                |
|                     | Brook trout.....         |            |                      | 17,900                |
|                     | White-fish.....          | 48,160,000 |                      |                       |
|                     | Pike perch.....          |            | 1,800,000            | 2,925                 |
| Rhode Island.....   | Black bass.....          |            |                      | 3,940                 |
|                     | Crappie.....             |            |                      | 2,350                 |
|                     | Rock bass.....           |            |                      |                       |
|                     | Shad.....                |            | 3,000,000            |                       |
|                     | Landlocked salmon.....   |            |                      | 1,000                 |
|                     | Rainbow trout.....       |            | 2,000                | 500                   |
| South Carolina..... | Brook trout.....         |            | 20,000               |                       |
|                     | Black bass.....          |            |                      | 625                   |
|                     | Lobster.....             |            | 2,462,000            |                       |
|                     | Shad.....                |            | 5,138,000            |                       |
|                     | Atlantic salmon.....     |            | 4,000                | 2,500                 |
|                     | Rainbow trout.....       |            |                      |                       |
| South Dakota.....   | Lake trout.....          |            | 20,000               |                       |
|                     | Pike perch.....          |            | 1,900,000            |                       |
|                     | Black bass.....          |            |                      | 3,625                 |
|                     | Rock bass.....           |            |                      | 400                   |
|                     | Loch Leven trout.....    |            | 13,760               | 5,000                 |
|                     | Rainbow trout.....       |            | 41,500               | 11,000                |
| Tennessee.....      | Black-spotted trout..... |            |                      | 342,000               |
|                     | Brook trout.....         |            | 209,000              | 56,650                |
|                     | Black bass.....          |            |                      | 10,316                |
|                     | Crappie.....             |            |                      | 2,200                 |
|                     | Rainbow trout.....       |            |                      | 76,184                |
|                     | Brook trout.....         |            |                      | 75                    |
| Texas.....          | Black bass.....          |            |                      | 5,895                 |
|                     | Crappie.....             |            |                      | 500                   |
|                     | Rock bass.....           |            |                      | 2,525                 |
|                     | Rainbow trout.....       |            |                      | 3,000                 |
|                     | Black bass.....          |            |                      | 80,060                |
|                     | Crappie.....             |            |                      | 4,425                 |
| Utah.....           | Rock bass.....           |            |                      | 5,155                 |
|                     | Strawberry bass.....     |            |                      | 200                   |
|                     | Bream.....               |            |                      | 2,830                 |
|                     | Landlocked salmon.....   | 10,000     |                      |                       |
|                     | Rainbow trout.....       | 26,700     |                      |                       |
|                     | Black-spotted trout..... |            |                      | 10,000                |
| Vermont.....        | Brook trout.....         | 50,000     |                      |                       |
|                     | Grayling.....            | 100,000    |                      |                       |
|                     | Landlocked salmon.....   | 35,000     |                      |                       |
|                     | Steelhead trout.....     |            | 10,000               | 13,724                |
|                     | Rainbow trout.....       |            | 2,000                | 36,283                |
|                     | Brook trout.....         | 50,000     | 436,000              | 1,341                 |
| Virginia.....       | Lake trout.....          | 250,000    | 190,000              | 15,629                |
|                     | Grayling.....            |            | 20,000               | 3,012                 |
|                     | Pike perch.....          |            | 17,399,000           |                       |
|                     | Black bass.....          |            |                      |                       |
|                     | Shad.....                |            | 12,411,500           | 100                   |
|                     | Rainbow trout.....       |            | 148,700              | 126,692               |
| Washington.....     | Brook trout.....         |            | 8,000                | 26                    |
|                     | Black bass.....          |            |                      | 100                   |
|                     | Crappie.....             |            |                      | 2,750                 |
|                     | Rock bass.....           |            |                      | 5,050                 |
|                     | Quinnat salmon.....      |            | 12,816,129           |                       |
|                     | Blueback salmon.....     |            | 3,371,000            |                       |
| Washington.....     | Steelhead trout.....     |            | 110,000              |                       |
|                     | Black-spotted trout..... |            |                      | 30,000                |
|                     | Brook trout.....         | 20,000     | 20,000               | 44,250                |
|                     | Lake trout.....          |            | 24,950               |                       |
|                     | White-fish.....          |            | 730,000              |                       |

*Distribution and assignments of fish and eggs among the States and Territories—Cont'd.*

| State or Territory. | Species.            | Eggs.                | Fry and fingerlings.    | Adults and yearlings. |
|---------------------|---------------------|----------------------|-------------------------|-----------------------|
| West Virginia       | Rainbow trout       |                      |                         | 7, 100                |
|                     | Brook trout         | 100, 000             |                         | 2, 000                |
|                     | Black bass          |                      |                         | 1, 657                |
|                     | Crappie             |                      |                         | 1, 640                |
| Wisconsin           | Rock bass           |                      |                         | 330                   |
|                     | Steelhead trout     |                      | 10, 000                 | 5, 000                |
|                     | Rainbow trout       |                      | 26, 000                 | 4, 000                |
|                     | Black-spotted trout | 25, 000              |                         |                       |
|                     | Brook trout         |                      | 154, 000                | 38, 600               |
|                     | Lake trout          |                      | 790, 000                |                       |
| Wyoming             | Grayling            | 200, 000             | 75, 000                 |                       |
|                     | White-fish          | 55, 000, 000         | 1, 800, 000             |                       |
|                     | Black bass          |                      |                         | 2, 540                |
|                     | Steelhead trout     | 83, 000              |                         |                       |
|                     | Rainbow trout       | 50, 000              |                         |                       |
|                     | Black-spotted trout | 150, 000             |                         | 20, 000               |
|                     | Brook trout         | 135, 000             | 48, 000                 | 10, 000               |
|                     | Lake trout          | 500, 000             |                         |                       |
|                     | Grayling            | 125, 000             |                         | 8, 000                |
|                     | Black bass          |                      |                         | 200                   |
| Foreign countries:  | Crappie             |                      |                         | 200                   |
|                     | Canada              |                      |                         |                       |
|                     | Lake trout          |                      | 360, 000                |                       |
|                     | England             |                      |                         |                       |
|                     | Landlocked salmon   | 10, 000              |                         |                       |
|                     | Rainbow trout       | 25, 000              |                         |                       |
|                     | Lake trout          | 25, 000              |                         |                       |
|                     | Ireland             |                      |                         |                       |
|                     | Rainbow trout       | 25, 000              |                         |                       |
|                     | Mexico              |                      |                         |                       |
|                     | do.                 | 25, 000              |                         |                       |
|                     | Germany             |                      |                         |                       |
|                     | Steelhead trout     | 25, 000              |                         |                       |
|                     | Rainbow trout       | 25, 000              |                         |                       |
| Japan               |                     |                      |                         |                       |
| Brook trout         | 25, 000             |                      |                         |                       |
| Belgium             |                     |                      |                         |                       |
| Black-spotted trout | 10, 000             |                      |                         |                       |
|                     | <b>Total</b>        | <b>198, 672, 200</b> | <b>1, 290, 000, 926</b> | <b>6, 870, 248</b>    |

*Fish and eggs furnished for distribution during the fiscal year ending June 30, 1902.*

| Source of supply.               | Species.          | Eggs.    | Fry and fingerlings. | Adults and yearlings. |
|---------------------------------|-------------------|----------|----------------------|-----------------------|
| Green Lake, Me                  | Landlocked salmon | 45, 000  |                      |                       |
|                                 | Brook trout       | 370, 000 |                      |                       |
| Craig Brook, Me. <sup>a</sup>   | Atlantic salmon   | 300, 000 | 1, 081, 388          | 282, 300              |
|                                 | Landlocked salmon | 155, 000 | 48, 715              | 20, 758               |
|                                 | Steelhead trout   |          | 90, 000              | 84                    |
|                                 | Scotch sea trout  | 10, 000  | 12, 046              | 84                    |
|                                 | Brook trout       |          | 7, 694               | 6, 837                |
|                                 | Rainbow trout     |          | 5, 475               | 1, 143                |
|                                 | Grayling          |          |                      | 4, 406                |
| Grand Lake Stream, Me           | Rainbow trout     |          | 86, 333              |                       |
|                                 | Landlocked salmon |          | 429, 785             | 53, 825               |
| Nashua, N. H                    | Landlocked salmon |          |                      | 11, 262               |
|                                 | Brook trout       | 100, 000 | 470, 000             | 62, 741               |
|                                 | Rainbow trout     |          | 8, 000               |                       |
|                                 | Lake trout        |          | 160, 000             |                       |
|                                 | Golden trout      |          | 70, 000              |                       |
| St. Johnsbury, Vt. <sup>b</sup> | Landlocked salmon |          |                      | 12, 728               |
|                                 | Brook trout       | 120, 000 | 471, 000             | 5, 634                |
|                                 | Rainbow trout     |          | 5, 000               | 1, 341                |
|                                 | Steelhead trout   |          | 10, 000              | 36, 285               |
|                                 | Lake trout        |          | 190, 900             | 3, 028                |
|                                 | Grayling          |          | 20, 000              |                       |
| Gloucester, Mass. <sup>c</sup>  | Cod               |          | 83, 191, 000         |                       |
|                                 | Lobster           |          | 74, 340, 000         |                       |
| Woods Hole, Mass. <sup>d</sup>  | Cod               |          | 128, 810, 000        |                       |
|                                 | Flat-fish         |          | 168, 133, 000        |                       |
|                                 | Lobster           |          | 6, 680, 000          |                       |

<sup>a</sup> Besides the above there were transferred from Craig Brook Station to other stations 10,000 Atlantic-salmon eggs, 65,000 landlocked-salmon eggs, and to Charleston (S. C.) Exposition 5,000 Atlantic-salmon eggs, 5,000 landlocked-salmon eggs, and to the Washington (D. C.) Aquarium 528 adult fish of various species; also 100,000 landlocked-salmon fry were transferred to Green Lake Station to be reared.

<sup>b</sup> In addition to the above, there were transferred from St. Johnsbury Station to other stations of the U. S. Fish Commission 10,000 brook-trout eggs and 100,000 brook-trout fry.

<sup>c</sup> In addition to the above there were transferred from Gloucester Station to Woods Hole Station for scientific purposes 2,000,000 lobster eggs and 180,000 lobster fry.

<sup>d</sup> In addition to the above there were transferred to Gloucester Station, for hatching, 6,318,000 cod eggs, and there were delivered to Mr. Geo. H. Sherwood, for scientific investigation, 4,689,000 lobster eggs and 5,750,000 lobster fry.



*Fish and eggs furnished for distribution during fiscal year ending June 30, 1902—Cont'd.*

| Source of supply.                 | Species.                     | Eggs.         | Fry and fingerlings. | Adults and yearlings. |         |
|-----------------------------------|------------------------------|---------------|----------------------|-----------------------|---------|
| Cape Vincent, N. Y.               | Brook trout                  |               | 749,350              |                       |         |
|                                   | Rainbow trout                |               | 38,360               |                       |         |
|                                   | Lake trout                   |               | 3,088,880            |                       |         |
|                                   | Pike perch                   |               | 10,000,000           |                       |         |
|                                   | White-fish                   |               | 34,300,000           |                       |         |
| Swanton (substation)              | Steelhead trout              |               |                      | 1,319                 |         |
|                                   | Pike perch                   |               | 20,575,000           |                       |         |
| Steamer Fish Hawk <sup>a</sup>    | Shad                         |               | 25,997,000           |                       |         |
| Battery Station, Md. <sup>b</sup> | Shad                         |               | 14,943,000           |                       |         |
| Fish Lakes, D. C. <sup>c</sup>    | Black bass                   |               |                      | 4,464                 |         |
|                                   | Crappie                      |               |                      | 13,903                |         |
|                                   | Shad                         |               |                      | 2,000,000             |         |
|                                   | Cat-fish                     |               |                      | 30,000                |         |
|                                   | Brook trout                  |               | 8,000                |                       |         |
| Central Station, D. C.            | Rainbow trout                |               | 4,200                |                       |         |
|                                   | Lake trout                   |               | 53,200               |                       |         |
|                                   | Pike perch                   |               | 1,800,000            |                       |         |
|                                   | White-fish                   |               | 600,000              |                       |         |
|                                   | Atlantic salmon              |               | 4,050                |                       |         |
|                                   | Landlocked salmon            |               | 3,870                |                       |         |
|                                   | Shad                         |               | 1,850,000            |                       |         |
|                                   | Shad                         |               | 34,994,000           |                       |         |
|                                   | Shad                         |               | 175,000              | 145,000               | 208,460 |
|                                   | Wytheville, Va. <sup>e</sup> | Rainbow trout |                      |                       | 13,124  |
| Erwin, Tenn.                      | Brook trout                  |               |                      | 3,815                 |         |
|                                   | Black bass                   |               |                      | 8,700                 |         |
|                                   | Rock bass                    |               |                      | 133,925               |         |
| Cold Springs, Ga.                 | Rainbow trout                |               |                      | 12,075                |         |
|                                   | Brook trout                  |               |                      | 1,050                 |         |
|                                   | Black bass                   |               |                      | 13,310                |         |
|                                   | Bream                        |               |                      | 17,350                |         |
| Edenton, N. C.                    | Speckled cat-fish            |               |                      | 5,850                 |         |
|                                   | Shad                         |               | 24,662,000           |                       |         |
| Charleston (S. C.) Exposition     | Shad                         |               | 2,700,000            |                       |         |
|                                   | Pike perch                   |               | 2,000,000            |                       |         |
|                                   | Lake trout                   |               | 20,000               |                       |         |
|                                   | Atlantic salmon              |               | 4,700                |                       |         |
|                                   | Pike perch                   | 60,000,000    | 143,000,000          |                       |         |
|                                   | White-fish                   | 56,260,000    | 200,500,000          |                       |         |
| Put-in Bay, Ohio <sup>f</sup>     | Brook trout                  |               |                      | 1,031,000             |         |
|                                   | Rainbow trout                |               |                      | 86,000                |         |
| Northville, Mich. <sup>g</sup>    | Loch Leven trout             |               |                      | 75,000                |         |
|                                   | Lake trout                   | 2,535,000     | 6,025,000            |                       |         |
|                                   | Steelhead trout              |               | 140,000              |                       |         |
|                                   | Grayling                     |               | 200,000              |                       |         |
|                                   | Lake trout                   |               | 2,530,000            |                       |         |
|                                   | White-fish                   |               | 42,500,000           |                       |         |
|                                   | Lake trout                   | 1,000,000     | 2,700,000            |                       |         |
|                                   | White-fish                   |               | 40,000,000           |                       |         |
|                                   | White-fish                   | 55,000,000    | 135,000,000          |                       |         |
|                                   | Duluth, Minn. <sup>i</sup>   | Brook trout   |                      | 92,230                |         |
| Alpena Substation                 | Rainbow trout                |               | 32,000               |                       |         |
|                                   | Steelhead trout              |               | 96,900               | 30,000                |         |
|                                   | Grayling                     |               | 199,000              |                       |         |
|                                   | Lake trout                   | 1,700,000     | 7,150,000            |                       |         |
|                                   | White-fish                   |               | 29,800,000           |                       |         |

<sup>a</sup> In addition to the above there were transferred from steamer *Fish Hawk* to Central Station 621,000 shad eggs.

<sup>b</sup> In addition to the above there were transferred from Battery Station to Central Station 267,000 shad eggs, and to Charleston (S. C.) Exposition 2,134,000 shad eggs.

<sup>c</sup> In addition to the above there were transferred from Fish Lakes to Erwin Station 3,550 crappie for breeding purposes, and to the aquarium at Central Station and to Buffalo and Charleston exhibitions 249 black bass and 15 crappie.

<sup>d</sup> In addition to the above there were transferred from Bryan Point to Central Station 2,421,000 shad eggs, and to the Charleston (S. C.) Exposition 2,007,000 shad eggs.

<sup>e</sup> In addition to the above there were transferred from Wytheville Station to other stations of the U. S. Commission of Fish and Fisheries 60,000 rainbow-trout eggs and 300 rock bass, and to Charleston (S. C.) Exposition 10,000 rainbow-trout eggs, and to Norfolk (Va.) School 1,000 rainbow-trout eggs.

<sup>f</sup> In addition to the above there were transferred from Put-in Bay Station to other stations of the U. S. Commission of Fish and Fisheries 2,000,000 pike-perch eggs and 32,212,000 white-fish eggs, and to the Charleston (S. C.) Exposition 4,000,000 pike-perch eggs.

<sup>g</sup> In addition to the above there were transferred from the Northville Station to other stations of the U. S. Commission of Fish and Fisheries 6,653,000 lake-trout eggs and to the Fish and Game Association, Philadelphia, Pa., 5,000 lake trout eggs.

<sup>h</sup> In addition to the above there were transferred from the Detroit Substation to other stations of the U. S. Commission of Fish and Fisheries 146,480,000 white-fish eggs, and to Fish and Game Association, Philadelphia, Pa., 320,000 white-fish eggs.

<sup>i</sup> In addition to the above there were transferred from Duluth Station to other stations of the U. S. Commission of Fish and Fisheries 6,121,000 lake-trout eggs.

*Fish and eggs furnished for distribution during fiscal year ending June 30, 1902—Cont'd.*

| Source of supply.             | Species.            | Eggs.      | Fry and fingerlings. | Adults and yearlings. |
|-------------------------------|---------------------|------------|----------------------|-----------------------|
| Quincy, Ill. <sup>a</sup>     | Black bass          |            |                      | 51,500                |
|                               | Crappie             |            |                      | 2,170                 |
|                               | Warmouth bass       |            |                      | 100                   |
| Manchester, Iowa <sup>b</sup> | Sun-fish            |            |                      | 300                   |
|                               | Brook trout         | 50,000     | 189,000              | 49,200                |
|                               | Rainbow trout       | 175,000    | 241,000              | 69,000                |
|                               | Lake trout          |            | 44,000               |                       |
|                               | Grayling            |            | 50,000               |                       |
|                               | Quinnat salmon      |            | 4,000                |                       |
|                               | Black bass          |            |                      | 105,976               |
|                               | Rock bass           |            |                      | 14,450                |
|                               | Crappie             |            |                      | 724,680               |
|                               | Sun-fish            |            |                      | 604,340               |
|                               | Cat-fish            |            |                      | 60,320                |
| Neosho, Mo. c                 | Yellow perch        |            |                      | 1,700                 |
|                               | Bream               |            |                      | 600                   |
|                               | Pickeral            |            |                      | 805                   |
|                               | Pike perch          |            |                      | 575                   |
|                               | Buffalo-fish        |            |                      | 200,000               |
|                               | Rainbow trout       | 47,790     | 25,000               | 44,088                |
|                               | Black bass          |            |                      | 9,514                 |
|                               | Rock bass           |            |                      | 18,400                |
|                               | Strawberry bass     |            |                      | 3,251                 |
|                               | Sun-fish            |            |                      | 1,500                 |
|                               | San Marcos, Tex     | Black bass |                      |                       |
| Rock bass                     |                     |            |                      | 4,555                 |
| Crappie                       |                     |            |                      | 4,555                 |
| Bream                         |                     |            |                      | 2,830                 |
| Strawberry bass               |                     |            |                      | 200                   |
| Leadville, Colo. d            | Brook trout         | 125,000    | 745,000              | 127,500               |
|                               | Black-spotted trout | 145,000    |                      | 847,000               |
|                               | Rainbow trout       |            | 160,000              | 5,200                 |
|                               | Loch Leven trout    |            | 3,000                |                       |
|                               | Grayling            |            | 100,000              |                       |
| Spearfish, S. Dak. e          | Brook trout         | 155,000    | 269,000              | 73,500                |
|                               | Black-spotted trout |            |                      | 882,000               |
|                               | Rainbow trout       |            | 41,500               | 10,000                |
|                               | Loch Leven trout    |            | 14,000               | 5,000                 |
| Bozeman, Mont. f              | Black-spotted trout | 135,000    | 100,000              | 262,500               |
|                               | Brook trout         |            |                      | 24,000                |
|                               | Steelhead trout     |            |                      | 10,000                |
| Baird, Cal. g                 | Grayling            | 655,000    | 525,000              | 18,000                |
|                               | Quinnat salmon      | 5,706,410  | 2,115,660            |                       |
| Battle Creek, Cal             | Quinnat salmon      | 9,354,000  |                      |                       |
| Mt. Creek, Cal                | Quinnat salmon      | 2,420,000  |                      |                       |
| Clackamas, Oreg               | Quinnat salmon      |            | 8,515,698            |                       |
|                               | Brook trout         |            | 157,989              | 69,901                |
|                               | Rainbow trout       |            |                      | 18,845                |
|                               | Lake trout          |            | 70,498               |                       |
|                               | White-fish          |            | 750,000              |                       |
| Rogue River, Oreg. h          | Quinnat salmon      | 1,866,000  | 3,071,363            |                       |
|                               | Silver salmon       |            | 424,530              |                       |
|                               | Steelhead trout     | 68,000     | 20,250               |                       |
| Little White Salmon, Wash     | Quinnat salmon      |            | 15,687,687           |                       |
|                               | Blueback salmon     |            | 3,371,000            |                       |
|                               | Quinnat salmon      |            | 50,000               |                       |
| Baker Lake, Wash              | Steelhead trout     |            | 110,000              |                       |

<sup>a</sup> In addition to the above there were transferred from Quincy Station to Buffalo Exposition 158 adult miscellaneous fishes.

<sup>b</sup> In addition to the above there were transferred from Manchester Station to other stations of the U. S. Commission of Fish and Fisheries 350,000 rainbow-trout eggs; to the Buffalo Exposition, 300 quinnat salmon; to Interstate Fish and Game Association, Chicago, Ill., 25 adult grayling, and to the Buffalo Exposition, 102 miscellaneous fishes.

<sup>c</sup> In addition to the above there were transferred from Neosho Station to other stations of the U. S. Commission of Fish and Fisheries 255,100 rainbow-trout eggs, and to universities for experimental purposes 1,525 rainbow-trout eggs.

<sup>d</sup> In addition to the above there were transferred from Leadville Station to other stations of the U. S. Commission of Fish and Fisheries 550,000 brook-trout eggs, and to the Pan-American Exposition, Buffalo, N. Y., 30,000 black-spotted-trout eggs.

<sup>e</sup> In addition to the above there were transferred from Spearfish Station to other stations of the U. S. Commission of Fish and Fisheries 200,000 brook-trout eggs.

<sup>f</sup> In addition to the above there were transferred from Bozeman Station to other stations of the U. S. Commission of Fish and Fisheries 800,000 grayling eggs.

<sup>g</sup> In addition to the above there were transferred from Baird Station to other stations of the U. S. Commission of Fish and Fisheries 20,000 quinnat-salmon eggs, and to the Pan-American Exposition, Buffalo, N. Y., 30,000 quinnat-salmon eggs.

<sup>h</sup> In addition to the above there were transferred from Rogue River Station to other stations of the U. S. Commission of Fish and Fisheries 413,000 steelhead-trout eggs.

*Summary of distribution.*

| Species.               | Eggs.       | Fry and fingerlings. | Adults and yearlings. | Total.        |
|------------------------|-------------|----------------------|-----------------------|---------------|
| Shad                   |             | 104,986,000          | 2,000,000             | 106,986,000   |
| Quinnat salmon         | 19,346,410  | 29,337,308           |                       | 48,683,718    |
| Atlantic salmon        | 300,000     | 56,765               | 282,000               | 638,765       |
| Landlocked salmon      | 200,000     | 523,655              | 98,565                | 822,220       |
| Silver salmon          |             | 424,530              |                       | 424,530       |
| Blueback salmon        |             | 3,371,000            |                       | 3,371,000     |
| Steelhead trout        | 68,000      | 389,196              | 77,686                | 634,882       |
| Loch Leven trout       |             | 91,760               | 5,000                 | 96,760        |
| Rainbow trout          | 397,790     | 784,835              | 492,496               | 1,675,121     |
| Black-spotted trout    | 280,000     | 100,000              | 1,488,500             | 1,868,500     |
| Brook trout            | 920,000     | 5,222,422            | 437,340               | 6,579,762     |
| Lake trout             | 5,235,000   | 22,022,478           | 3,012                 | 27,260,490    |
| Scotch sea trout       | 10,000      | 7,694                | 6,837                 | 24,531        |
| Golden trout           |             | 69,950               |                       | 69,950        |
| Grayling               | 655,000     | 1,130,333            | 17,925                | 1,803,258     |
| White-fish             | 111,280,000 | 483,230,000          |                       | 594,490,000   |
| Pike perch             | 60,000,000  | 177,099,000          | 575                   | 237,099,575   |
| Pickeral               |             |                      | 805                   | 805           |
| Cut-fish               |             |                      | 95,970                | 95,970        |
| Yellow perch           |             |                      | 1,700                 | 1,700         |
| Buffalo-fish           |             |                      | 200,000               | 200,000       |
| Black bass             |             |                      | 262,157               | 262,157       |
| Crappie                |             |                      | 735,120               | 735,120       |
| Strawberry bass        |             |                      | 3,551                 | 3,551         |
| Rock bass              |             |                      | 37,170                | 37,170        |
| Warmouth bass          |             |                      | 100                   | 100           |
| Sun-fish and bream     |             |                      | 623,739               | 623,739       |
| Cod                    |             | 212,001,000          |                       | 212,001,000   |
| Flat-fish              |             | 168,133,000          |                       | 168,133,000   |
| Lobster                |             | 81,020,000           |                       | 81,020,000    |
| Totals and grand total | 198,672,200 | 1,290,000,926        | 6,870,248             | 1,495,543,374 |

**RAILROAD TRANSPORTATION.**

The cars of the Commission while distributing fishes during the fiscal year have traveled 95,259 miles, and detached messengers 199,944 miles. The work of distribution has been greatly facilitated by the free transportation furnished through the courtesy of the following railroads:

*Statement of free transportation furnished by certain railroads.*

| Name of railroad.                         | Cars. | Messen-<br>gers. | Name of railroad.                       | Cars. | Messen-<br>gers. |
|---|-------|------------------|---|-------|------------------|
| Astoria and Columbia River R. R.          |       | 236              | Detroit and Mackinac Rwy                | 756   | 252              |
| Atehison, Topeka and Santa Fe Rwy         | 348   |                  | Elgin, Joliet and Eastern Rwy           |       | 20               |
| Atlantic Coast Line R. R.                 | 456   |                  | El Paso and Northeastern R. R.          |       | 330              |
| Baltimore and Ohio R. R.                  | 19    |                  | Florida East Coast Rwy                  |       | 250              |
| Bangor and Aroostook R. R.                | 1,194 | 608              | Fort Worth and Denver City Rwy          |       | 2,312            |
| Boston and Maine R. R.                    |       | 7,379            | Grand Trunk Rwy. System                 |       | 197              |
| Burlington, Cedar Rapids and Northern Rwy | 1,684 | 1,282            | Great Northern Rwy. Line                | 1,378 |                  |
| Central Vermont Rwy                       |       | 502              | Gulf, Colorado and Santa Fe Rwy         |       | 6,445            |
| Chicago and Northwestern Rwy              | 177   | 1,531            | Houston and Texas Central R. R.         |       | 922              |
| Chicago, Burlington and Quincy R. R.      | 3,892 | 2,809            | Houston, East and West Texas Rwy        |       | 656              |
| Chicago, Rock Island and Pacific Rwy      |       | 62               | Illinois Central R. R.                  |       | 497              |
| Chicago, Rock Island and Texas Rwy        |       | 183              | International and Great Northern R. R.  |       | 8,714            |
| Colorado and Southern Rwy                 | 74    | 3,036            | Jacksonville and St. Louis Rwy          |       | 51               |
| Colorado Midland Rwy                      | 139   | 1,034            | Lake Erie and Western R. R.             |       | 8                |
| Cooperstown and Charlotte Valley R. R.    |       | 50               | Linville River R. R.                    |       | 13               |
| Crystal River R. R.                       |       | 154              | Maine Central R. R.                     |       | 612              |
| Delaware, Lackawanna and Western R. R.    |       | 242              | Michigan Central R. R.                  |       | 1,592            |
| Denver and Rio Grande R. R.               | 592   | 8,718            | Mobile and Ohio R. R.                   |       | 1,721            |
|   |       |                  | Monson R. R.                            |       | 12               |
|   |       |                  | Montana R. R.                           |       | 188              |
|   |       |                  | Montpelier and Wells River R. R.        |       | 192              |
|   |       |                  | New York Central and Hudson River R. R. |       | 149              |

*Statement of free transportation furnished by certain railroads—Continued.*

| Name of railroad.                                | Cars. | Messen-<br>gers. | Name of railroad.                          | Cars.  | Messen-<br>gers. |
|--|-------|------------------|--|--------|------------------|
| Norfolk and Western Rwy .....                    | 754   | 621              | Seaboard Air Line Rwy .....                | 1,690  | .....            |
| Northern Pacific Rwy .....                       | 2,419 | 663              | Southern Rwy .....                         | 616    | 809              |
| Oregon R. R. and Navigation Co .....             | ..... | 714              | Southern Indiana Rwy .....                 | 121    | 74               |
| Oregon Short Line R. R. ....                     | 434   | .....            | Southern Pacific Co .....                  | .....  | 1,025            |
| Pennsylvania R. R. System .....                  | 608   | .....            | Texas and Pacific Rwy .....                | 882    | 2,314            |
| Pennsylvania Lines, west of Pitts-<br>burg ..... | 522   | .....            | Texas Central R. R. ....                   | .....  | 100              |
| Pere Marquette R. R. ....                        | 592   | 1,507            | Union Pacific R. R. ....                   | .....  | 118              |
| Plant System .....                               | 4,225 | 825              | United Verde and Pacific Rwy .....         | .....  | 26               |
| Queen and Crescent Route .....                   | 408   | .....            | Vandalia Line .....                        | 450    | .....            |
| Rio Grande Southern R. R. ....                   | ..... | 340              | Virginia-Carolina Rwy .....                | 52     | .....            |
| Rio Grande Western Rwy .....                     | 911   | .....            | Wabash R. R. ....                          | .....  | 1,607            |
| Rutland R. R. ....                               | ..... | 1,065            | Washington and Columbia River<br>Rwy ..... | 30     | .....            |
| St. Louis and San Francisco R. R. ....           | 1,043 | 1,509            | Washington County R. R. ....               | .....  | 204              |
| St. Louis Southwestern Rwy .....                 | ..... | 633              |  |        |                  |
| San Antonio and Aransas Pass<br>Rwy .....        | ..... | 427              | Total .....                                | 29,616 | 68,940           |

**BIOLOGICAL INQUIRIES.**

The experiments which have been carried on for several years at Lynnhaven, Va., to perfect a method by which oysters can be fattened and improved in flavor and food value are meeting with encouraging success. Means have been found to supply proper food in sufficient quantity and in a systematic manner, and it is believed in another season it can be demonstrated that oysters can be fattened for market by simple economical means. This will make the industry far more profitable than the present method of allowing the oysters to grow under natural conditions, which is always uncertain and often will not give the best results.

Successful results are hoped for from the experimental work carried on in Florida in raising sponges from cuttings. It is desired to discover methods which will be available for the practical sponge-grower and which will permit the cultivation of sponges systematically and assure the grower of regular marketable crops. As Florida can now supply only about half the demand of this country, and as the natural sponge-grounds are rapidly becoming depleted, the undertaking is watched with interest by prominent dealers.

A systematic investigation of the carp in the Great Lakes, where this species is very abundant, was undertaken on account of the disfavor in which it is held by many persons. Attention was given to the food and feeding of the carp, its relation to other fishes, and its food and market value. It is probable that the prejudice against this fish comes from a misapprehension and may be removed with a fuller knowledge of the facts. Much information on the subject has been obtained, and the inquiries will be continued another season.

The supposed destruction of fish and apparatus by sea lions has caused apprehension to the fishery interests of the Pacific coast, and in some localities systematic efforts have been made to kill off the herds. A diversity of opinion has existed as to the advisability of this course, for while the fishermen claim that great damage was done, this was

hardly substantiated by reliable data, and the extermination of the herds met with opposition in many quarters. The Commission was finally asked by the California authorities to make an investigation of the food and feeding habits of the sea lions with a view to determining the point at issue. This was accordingly undertaken by an agent of this office, assisted by a representative from both the California board of fish commissioners and the California Academy of Sciences, and was carried on during July and August. As thorough an inquiry as practicable was made, from which it appears that the sea lions did not do much damage except at the mouth of the Columbia River, but further study of some aspects of the case will be necessary before a definite conclusion can be reached.

At the request of oyster-growers of Tuckerton, N. J., a representative of the Commission was detailed to investigate the destruction of oyster beds in that vicinity by drum-fish. These fish feed on the seed oysters, which are the thin-shelled eastern forms, and cause enormous losses, many extensive beds being practically depleted. In one case, where some 20,000 bushels of oysters had been planted, an examination showed that over 80 per cent had been destroyed. Various expedients have been tried or suggested without much success, and it would seem that it will be necessary to use heavy-shelled oysters, which are strong enough to resist the drum-fish, for seed, rather than the thin-shelled ones. The former, however, at this particular locality do not attain so satisfactory a growth.

The biological survey of the Great Lakes has been continued, the work still being confined to Lake Erie with headquarters at the station of the Commission at Put-in Bay. Special attention was given to the white-fish, wall-eyed pike, carp, and sturgeon.

The investigations of the fisheries of the Territory of Hawaii, called for by act of Congress, were partially completed during the summer of 1901, most of the islands being visited, the fishery methods and laws studied, a statistical canvass made, and a large and interesting collection of fishes obtained. A preliminary report was made to the President in July, 1902, and by him submitted to Congress. As stated elsewhere, the investigation of the deeper waters around the islands is now being continued by means of the steamer *Albatross*.

Among other investigations may be mentioned the continuation of the biological study of the quinnat salmon in California, a further inquiry as to the results of introducing new species into certain lakes in Idaho and Utah, an inquiry into the geographical distribution of trout and salmon in the waters of Maine, and biological investigations of certain waters of New York and New Jersey.

The subject of the diseases of fishes has received considerable attention, the time of one assistant being entirely devoted thereto. Mortality from causes little understood in the Government hatcheries and

private establishments has always been a source of embarrassment and loss. These studies have been made at a number of places and under various conditions, and it is hoped they will result in rendering it possible to stamp out disease, or, better still, prevent its appearance.

The laboratories at Woods Hole and Beaufort, which have been open as usual during the season, have been utilized by a number of trained investigators, who are attracted by the facilities offered for biological research. The investigations carried on have direct bearing on the various problems related to the fisheries and are exceedingly valuable to the Commission in the performance of its functions.

In the laboratory at Washington studies have been made of various collections of fishes and of particular species, reports prepared, and much work of a miscellaneous character accomplished.

#### STATISTICAL INQUIRIES.

The principal statistical canvass undertaken was that of the Middle Atlantic States, and at the close of the fiscal year it was still in progress. Besides this, the lobster fishery and several inquiries relating to minor or local fisheries were covered.

At Boston and Gloucester, during the calendar year 1901, there were landed 151,165,191 pounds of fishery products, valued at \$4,245,951. These figures are somewhat less than in the preceding year, both in quantity and value, both ports participating in the decrease.

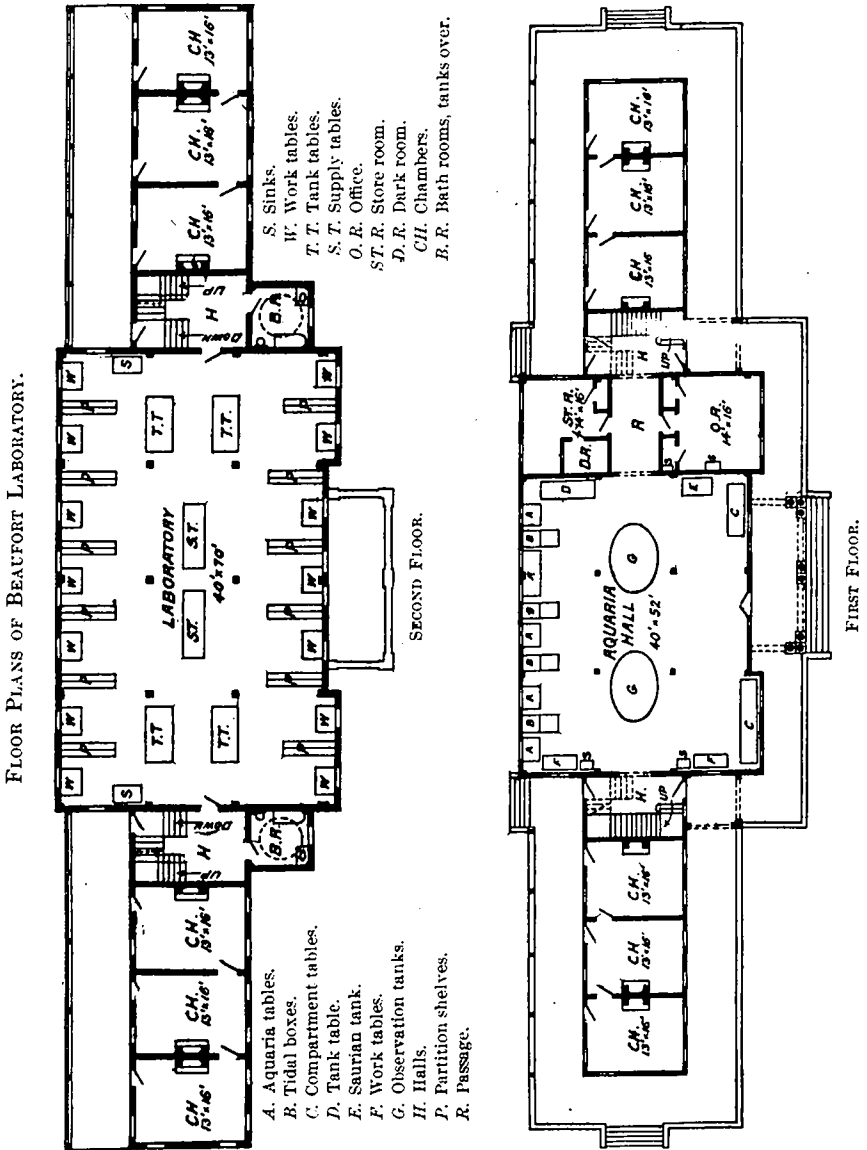
An inquiry prosecuted in the State of Utah developed that a considerable fishing industry, amounting to over 1,000,000 pounds and nearly \$50,000, is carried on in that State, the principal part of the catch being taken from Utah Lake and consisting mainly of carp, trout, and black bass. It is not possible to show the entire quantity taken, for here, as in other interior waters, much of the fishing is by sportsmen or for the personal use of the fishermen and is not reported.

In the season of 1901 a canvass of the lobster fishery of the Atlantic coast States was made, and interesting comparisons of the value of the industry for the preceding ten years will be found on pp. 156-158. This inquiry, which covered the calendar year 1900, showed a total investment of \$1,668,000 and that 4,348 persons were employed. While lobster fishing is carried on to some extent from New York and New Jersey, it is chiefly confined to the New England States, Maine having far the largest interest, followed by Massachusetts. The total yield was 15,767,700 pounds, having a first value of \$1,390,500.

In the report of the Division of Statistics, on pp. 154-155, will be found notes on salmon fishing with hand apparatus in several localities on the Pacific coast. This method of capture has achieved some commercial importance during the last few years, besides being in vogue with anglers. There are also given in the report the results of some inquiries respecting the trade in fur-seal skins in London.

## NEW STATIONS.

Work was begun on the biological station near Beaufort, N. C., the latter part of July, 1901, and it is now practically completed and in operation. It was desired to afford this establishment every facility

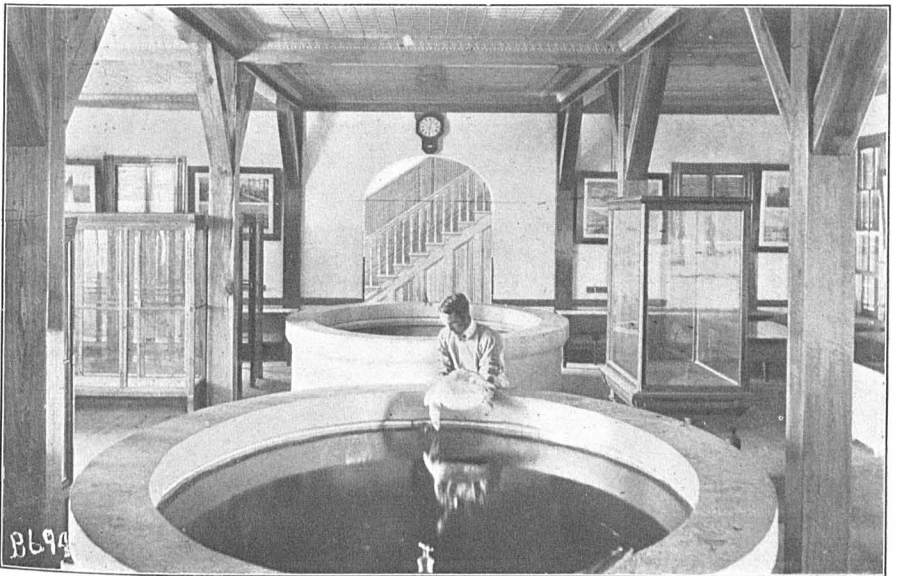


for carrying on marine biological research, for which it is admirably located, and its appointments and equipment, while plain, are substantial and as complete as possible.

The main building is a 2-story frame structure 70 by 42 feet, with



LABORATORY INTERIOR, BEAUFORT.



OBSERVATION TANK, BEAUFORT LABORATORY.



two wings each  $51\frac{1}{2}$  by  $17\frac{1}{2}$  feet, and contains a laboratory, aquarium, office, 12 bedrooms, commodious halls, 2 bathrooms, and storerooms. In front is a portico with a balcony, and around the sides is a veranda. In the center of the large aquaria hall are two oval tanks, 12 by 8 feet and 3 feet deep, constructed of white cedar and finished with cement. Along the north wall, in front of each window, are placed large aquaria with tidal boxes between. The room also contains a tank-table and saurian tank, three compartment hatching-tables, work-tables, and sinks. Along the north and south walls of the laboratory are compartments divided by partition shelves, each compartment being provided with a table for microscopes. Four large tank-tables, two at either end of the room, are arranged for the experimental work of the laboratory, while two long tables in the center contain lockers and shelves for the supplies. At each end are sinks. All other available space is used for show-cases.

Sixty-five feet north of the main building is the mess-house, a 1½-story frame structure, 36 by 33 feet, containing a dining-room, three bedrooms, kitchen, and bath. Near by is the power-house, 36 by 33 feet, in which are the boiler, pumps, dynamo, etc. All these buildings are lighted with electricity and have slate roofs. There are also a boat-house, fuel-shed, outbuildings, and a landing-pier 80 feet long. Fresh water is obtained from an artesian well 200 feet deep and a brick cistern with a capacity of 10,000 gallons. Salt and fresh water tanks are placed in towers on the wings of the main building, from which the water is distributed by pipe lines as needed.

Under the authority of an act of Congress approved June 6, 1900, correspondence was begun with a view to the selection of a site for a fish-cultural station in West Virginia, and during the fall of 1900 and the succeeding year a number of localities in different parts of the State were examined by the Commissioner personally and by agents of the Commission. A site about two-thirds of a mile from White Sulphur Springs, Greenbrier County, was finally decided upon as combining the desired requisites for both trout and bass culture. Here was found a spring flowing 1,800 gallons per minute, with a temperature of  $53^{\circ}$  in August. Below the spring several small runs, with temperatures of  $65^{\circ}$  to  $70^{\circ}$ , can be utilized, which will augment the supply by about 5,000 gallons per minute. Land was available where buildings can be advantageously erected and well adapted to the construction of ponds below the spring, and railroad facilities are good. Accordingly a tract of 25 acres was purchased June 26, 1902, and the preparation of plans was at once begun.

An item in the urgent deficiency bill approved February 14, 1902, so amended an item in the sundry civil bill approved March 3, 1901, providing for the establishment of a fish-cultural station at Tupelo, Miss., as to allow the purchase of land. The wording of the act limited the location of the station to the town of Tupelo, and a site

comprising 28 acres was selected on its southeast border, where it would appear that a water supply can be obtained by artesian wells. Steps have been taken to acquire the property.

An act of Congress approved February 4, 1901, provided for a lobster hatchery on the Maine coast, and after an examination of different localities by the Commissioner and representatives of the Commission conversant with the needs of such an establishment, McKown Point, on the southwest side of Boothbay Harbor, was chosen. This is about  $3\frac{1}{2}$  miles by land and about a mile by water from the town of Boothbay Harbor, Lincoln County, where there are daily boat connections with Bath and other important towns. The site selected has an area of 9 acres. It is on a rocky point with deep water close to the shore, thus insuring a good water supply by pumping even at low tide; boat landings can be advantageously constructed, and the ground lies well for a convenient arrangement of the hatchery and other buildings. Moreover, Boothbay Harbor is an excellent center for obtaining egg lobsters in quantities for artificial propagation, which is a matter of importance.

#### STEAMER ALBATROSS.

The salmon investigations conducted with this vessel during the summer of 1901 were carried on in southeast Alaska, and it was intended to complete the survey begun in 1897. Smallpox broke out among the crew, compelling the return of the ship earlier than was intended, but though an examination of all the new canneries in this part of the Territory was interfered with, the stream and lake work was practically completed. The vessel reached Seattle early in September. A report covering the salmon investigation for 1900 and 1901 will soon be issued, which, taken in connection with that of 1897, it is believed will give a comprehensive account of the commercial aspects of the salmon interests of Alaska.

During September and October an examination was made along the coasts of Washington, Oregon, and California, looking to the movements of salmon at sea and the results of the introduction of eastern lobsters and crabs. At the end of October the *Albatross* was in San Francisco for the purpose of refitting and making minor repairs preparatory to her next duty.

In continuation of the investigation of the Hawaiian fisheries, begun in 1901 by direction of Congress, it was decided to send the *Albatross* to those islands to study the conditions in the surrounding waters. An arrangement was made with Dr. David Starr Jordan to have general supervision of the expedition, and Dr. Charles H. Gilbert was put in immediate charge of the scientific work. The investigation was to embrace dredging and collecting in channels and on the banks about the islands, and a thorough examination of the surroundings of Kauai, the oldest of the group, of outlying reefs about the islands northwest

of Kauai, and of the different fishing-banks. It is believed information of both commercial and scientific importance will be gained. The vessel sailed from San Francisco March 11, arriving at Honolulu March 24, where the investigation was at once begun and is now in progress.

On October 26, 1901, by order of the Secretary of the Navy, Commander Jefferson F. Moser, U. S. Navy, was detached from the command of the *Albatross* and was succeeded by Commander Chauncey Thomas, U. S. Navy. Commander Moser's services with this Commission covered a period of over four years and were efficient and valuable. His detachment was viewed with regret.

#### STEAMER FISH HAWK.

On July 3, 1901, this vessel left Gloucester City, N. J., for Woods Hole, Mass., where she was detailed for duty in connection with the laboratory until September, when she was sent to Baltimore to undergo considerable repairs. It having been determined to use her in connection with the sponge investigations on the Florida coast, she sailed from Baltimore October 8, 1901, arriving at Cedar Keys, where it was decided to establish headquarters, on the 21st. The work outlined for the vessel was to determine and plot the area of the different sponge-grounds; to investigate the nature of the bottom and depth of water as affecting the growth, distribution, and abundance of marketable sponges; and to examine biologically certain areas, making as complete collections of specimens as possible. A survey covering all the sponge-grounds on the west coast of Florida, north of Tampa Bay, was continued till January 29, 1902, during which lines of soundings and dredgings, about 5 miles distant from each other, were made from shoal water out to a depth of about 10 fathoms. On completing this work the vessel proceeded to Key West, Fla., and made a series of dredgings for the purpose of determining the nature of the marine fauna in this region as bearing on the advisability of establishing a biological station at Key West, and also to ascertain the condition of the sponge-grounds in this region. During the season collections of live fishes were made for the aquarium at the Charleston Exposition. The results of these operations, though considerably retarded by bad weather, are regarded as successful, and will be enlarged on when the complete reports of the condition and resources of the Florida sponge-grounds are published.

From March 17 to April 10 the *Fish Hawk* was at Charleston, S. C., moored at the Exposition grounds, where she formed an attractive feature of the exhibit of the Commission by illustrating the methods of carrying on deep-sea investigations, with the appropriate apparatus. After some repairs at Baltimore the vessel proceeded to Gloucester City, N. J., and on April 29 the usual spring shad-hatching on the Delaware was taken up and continued until the close of the fiscal year. The fish-cultural work is referred to elsewhere.

## EXPOSITIONS.

At the close of the Pan-American Exposition at Buffalo, November 1, 1901, it was desired by those interested to have the Government exhibits sent to the South Carolina Interstate and West Indian Exposition, which was to open at Charleston, S. C., December 1. Congress at that time had provided no funds for the purpose, but with the approval of the President the heads of the Executive Departments directed that such parts of their respective exhibits as might be desired should be sent to Charleston for display there, provided that all the expenses should be borne by the exposition authorities. Accordingly, the Commission sent its entire exhibit directly from Buffalo to Charleston, where it was installed in a building constructed for the purpose, with an amount of space equal to that in Buffalo, except that the aquarium was much smaller.

By an act approved January 21, 1902, Congress appropriated \$90,000 to defray the expense of the Government exhibit. At the close of the exposition, on the 31st of May, 1902, the material was returned to Washington.

The board of directors of the Pan-American Exposition awarded commemorative diplomas to the Commission for its exhibits as follows: The collective exhibit; the aquarium; the hatching and transporting apparatus; fishing apparatus and accessories; scientific researches; products of fisheries; sponges; collection of pearls and pearl-bearing shells; reports and bulletins. The Interstate and West Indian Exposition awarded a diploma and gold medal.

By an act approved March 3, 1901, Congress appropriated \$5,250,000 for the Louisiana Purchase Exposition to be held in St. Louis in 1903. The act directed the appointment by the President of a national commission and also that the Executive Departments and bureaus, including this Commission, should take part. The Government exhibit, as usual, is to be under the direct control of a board of management consisting of a representative from each establishment participating. Mr. W. de C. Ravenel, who has represented the Commission at all the recent expositions, was designated to act in a similar capacity at St. Louis. The opening of the exposition has been deferred till 1904.

Invitations to participate in the below-mentioned expositions were received, but could not be accepted in the absence of specific authority from Congress:

- International Exposition of Hygiene, Maritime Security, and Fishing, Ostend, August-September, 1901; organized under the auspices of the Communal Administration.
- International Exhibition of Fisheries, St. Petersburg, February-March, 1902; organized by the Imperial Society of Fisheries and Fish-Culture.
- International Fishery Exhibition, Vienna, September 6-21, 1902, on the occasion of the eighth Austrian Fishery Conference.
- Exposition of Hydro-biology, Fish-culture, and Fishing, Moscow, March, 1903; organized by the Ichthyological Section of the Imperial Society of Acclimatation of Russia.

## MISCELLANEOUS.

At Neosho, Mo., it was found advisable to obtain an addition of 3½ acres of land in order to control the water supply from Spring Branch and to extend the pond system. This purchase was made by deed dated June 6, 1901.

Two small tracts of land were also purchased at San Marcos in order to straighten the boundary lines of the property and to obtain additional area for new ponds with land and water rights adjacent to the San Marcos River. These purchases were deeded October 2, 1901, and March 27, 1902.

The increasing work involved in the collection and distribution of adult fishes in the Mississippi River and its tributaries in connection with the operations of the Manchester, Iowa, Station has rendered the use of a steamer specially constructed for the purpose very desirable, as by this means the work can be conducted more efficiently and economically. Accordingly, under authority of an act of Congress approved March 3, 1901, a contract was entered into with Kahlke Brothers, of Rock Island, Ill., to build a two-decked, stern-wheeled river steamboat 46 feet long, 20 feet beam, with 3 feet depth of hold. On the main deck are light galvanized-iron retaining-tanks, 4 feet by 2½ feet by 2 feet, for carrying fish, with pump, air-compressor, and necessary machinery for a complete circulating apparatus; on the deck above are the pilot-house and a deck-house containing four double bunks. The boat is propelled by a pair of lever engines, with a boiler 40 inches in diameter and 16 feet long. The vessel will be completed and ready for use during the coming season.

Besides the usual repairs to the steam launches and smaller vessels, to keep them in good condition, the *Shearwater* and *Senator* have been thoroughly overhauled, the hulls of both being practically rebuilt, as they were in bad condition and showed serious signs of decay.

## CHANGES IN PERSONNEL.

On February 14, 1902, Mr. W. de C. Ravenel, who had been assistant in charge of the Division of Fish-culture since 1895, severed his connection with the Commission to accept an administrative position with the United States National Museum. Mr. Ravenel, entering the service in 1884 as superintendent of the St. Jerome, Md., Station, had risen through different grades, and his record has always been distinguished for efficiency and business ability. He has taken a prominent part in the exposition work of the Commission, and has been its representative on the Government Boards of Managers at all the expositions held in this country, except at Cincinnati and Chicago. At the latter exposition he was chief special agent.

## PUBLICATIONS.

During the year there have been added to the library 115 books and 185 pamphlets and unbound volumes. The bound report for 1900 has been issued together with the following pamphlets:

- The Mollusca of Porto Rico, by W. H. Dall and C. T. Simpson. Bulletin for 1900, vol. 1, pp. 351-524, plates 53 to 58.
- The Brachyura and Macrura of Porto Rico, by Mary J. Rathbun. Bulletin for 1900, vol. 2, pp. 1 to 127+\*129 to \*137, plates 1 and 2.
- The Anomuran collections made by the *Fish Hawk* expedition to Porto Rico, by J. E. Benedict. Bulletin for 1900, vol. 2, pp. 129-148, plates 3-6.
- Stomatopoda of Porto Rico, by R. P. Bigelow. Bulletin for 1900, vol. 2, pp. 149-160.
- Report on Porto Rican Isopoda, by H. F. Moore. Bulletin for 1900, vol. 2, pp. 161-176, plates 7-11.
- The Cirripedia collected near Porto Rico by the *Fish Hawk* expedition in 1898-99, by M. A. Bigelow. Bulletin for 1900, vol. 2, pp. 177-180.
- The Polychaetous Annelids of Porto Rico, by A. L. Treadwell. Bulletin for 1900, vol. 2, pp. 181-210.
- Descriptions of two new leeches from Porto Rico, by J. Percy Moore. Bulletin for 1900, vol. 2, pp. 211-222, plates 12-13.
- The Nemertean of Porto Rico, by W. R. Coe. Bulletin for 1900, vol. 2, pp. 223-229.
- The Echinoderms of Porto Rico, by H. L. Clark. Bulletin for 1900, vol. 2, pp. 231-263, plates 14-17.
- The Alcyonaria of Porto Rico, by C. W. Hargitt and C. G. Rogers. Bulletin for 1900, vol. 2, pp. 265-287, plates 1-1v.
- The stony corals of Porto Rican waters, by T. Wayland Vaughan. Bulletin for 1900, vol. 2, pp. 289-320, plates 1-xxxviii.
- Actinaria from the vicinity of Porto Rico, by J. E. Duerden. Bulletin for 1900, vol. 2, pp. 321-374, plates 1-xii.
- The sponges collected in Porto Rico in 1899 by the U. S. Fish Commission steamer *Fish Hawk*, by H. V. Wilson. Bulletin for 1900, vol. 2, pp. 375-411.
- Dredging and other records of the U. S. Fish Commission steamer *Albatross*, with bibliography relative to the work of the vessel, compiled by C. H. Townsend. Report for 1900, pp. 387-562, plates 1-vii.
- The French sardine industry, by H. M. Smith. Bulletin for 1901, pp. 1-26, plates 1-8.
- Biological notes, No. 2, from the biological laboratory at Woods Hole. Bulletin for 1901, pp. 27-33.
- Description of a new oceanic fish found off southern New England, by Carl H. Eigenmann. Bulletin for 1901, pp. 35-36.
- The egg and development of the conger eel, by Carl H. Eigenmann. Bulletin for 1901, pp. 37-44.
- Investigations into the history of the young squeteague, by Carl H. Eigenmann. Bulletin for 1901, pp. 45-51.
- A new isopod parasitic on the hermit crab, by Millet T. Thompson. Bulletin for 1901, pp. 53-56, plates 9-10.
- The plants of western Lake Erie, with observations on their distribution, by A. J. Pieters. Bulletin for 1901, pp. 57-79, plates 11-20.
- The Leptocephalus of the American eel and other American Leptocephali, by C. H. Eigenmann and C. H. Kennedy. Bulletin for 1901, pp. 81-92.
- Report of the Commissioner for the fiscal year ending June 30, 1901, by George M. Bowers. Report for 1901, pp. 1-170.
- Publications of the United States Commission of Fish and Fisheries available for distribution on December 1, 1901. Report for 1901, pp. 177-192.
- Notes on the fishes and mollusks of Lake Chautauqua, N. Y., by B. W. Evermann and E. L. Goldsborough. Report for 1901, pp. 169-175.
- The Foraminifera of Porto Rico, by James M. Flint, medical director, U. S. Navy. Bulletin for 1900, vol. 2, pp. 413-416.
- Description of a new species of blenny from Japan, by Hugh M. Smith. Bulletin for 1901, pp. 93, 94.
- List of species known to occur in the Great Lakes or their connecting waters, by Barton Warren Evermann. Bulletin for 1901, pp. 95, 96.
- Notes on the tagging of four thousand adult cod at Woods Hole, Mass., by Hugh M. Smith. Report for 1901, pp. 193-208.
- Notes on the silversides of the genus *Menidia* of the east coast of the United States, by W. C. Kendall. Report for 1901, pp. 241-267.

- Notes on the Scotch methods of smoking haddocks, by Hugh M. Smith. Report for 1901, pp. 269-271.
- Notes on the fishes of Lake Ontario. An annotated list of the fishes known to occur in Lake Champlain and its tributary waters. An annotated list of the fishes known to occur in the St. Lawrence River. By B. W. Evermann and W. C. Kendall. Report for 1901, pp. 209-240.
- A report on fishes collected in Mexico and Central America, by B. W. Evermann and E. L. Goldsborough. Bulletin for 1901, pp. 137-159.
- The organic constituents of the scales of fish, by E. H. Green and R. W. Tower. Bulletin for 1901, pp. 97-102.
- The reactions of copepods to various stimuli and the bearing of this on daily depth migrations, by G. H. Parker. Bulletin for 1901, pp. 103-123.
- The gas in the swim-bladder of fishes. Biliary calculi in the squeteague, by R. W. Tower. Bulletin for 1901, pp. 126-135, plate 21.
- Description of new species of shad (*Alosa ohioensis*), with notes on other food-fishes of the Ohio River, by Barton Warren Evermann. Report for 1901, pp. 273-288.

There have been distributed during the year 1,815 bound and 19,210 pamphlet publications of the Commission.

The Museum of Comparative Zoology, Cambridge, Mass., has published under the general title, "Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, by the U. S. Fish Commission steamer *Albatross*, from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., commanding":

- I. Preliminary report and list of stations, by Alexander Agassiz; with remarks on deep-sea deposits, by Sir John Murray. (Vol. xxvi, No. 1.)
- II. Some species of *Partula* from Tahiti: A study in variation; by Alfred Goldsborough Mayer. (Vol. xxvi, No. 2.)
- III. Medusæ, by Alexander Agassiz and Alfred Goldsborough Mayer. (Vol. xxvi, No. 3.)

#### APPROPRIATIONS.

The appropriations available for conducting the Commission during the fiscal year 1902 were as follows:

|   |            |
|---|------------|
| Salaries.....   | \$234, 120 |
| Miscellaneous expenses:   |            |
| Administration.....   | 12, 500    |
| Propagation of food-fishes.....   | 175, 000   |
| Inquiry respecting food-fishes.....                                       | 22, 500    |
| Statistical inquiry.....  | 7, 500     |
| Maintenance of vessels.....   | 35, 000    |
| For improvement and enlargement of stations at—                           |            |
| Green Lake, Me.....   | 4, 000     |
| Woods Hole, Mass.....   | 2, 000     |
| For purchase of additional land and improvements at—                      |            |
| San Marcos, Tex.....  | 8, 000     |
| Neosho, Mo.....   | 7, 500     |
| For the construction of a steamboat for use on the Mississippi River..... | 5, 000     |
| For the establishment of a lobster hatchery on the coast of Maine.....    | 10, 000    |
| For the establishment of a fish-cultural station at Tupelo, Miss.....     | 20, 000    |

A report of the expenditure of these appropriations will be made to Congress in accordance with law.

GEORGE M. BOWERS,  
*Commissioner.*